WHAT IS CLAIMED IS:

1. A calcium fluoride crystal, characterized in that the calcium fluoride crystal is produced in accordance with a method for producing calcium fluoride crystal on the basis of refining a raw material of calcium fluoride and causing crystal growth of the refined calcium fluoride, the method including a process of raising a purity of the calcium fluoride to complement the refining, that a transition density in crystal is not greater than $1x10^5/cm^2$, and that dispersion of transition density inside an effective portion in crystal is in a range of $\pm 5x10^4/cm^2$.

2. A method of producing calcium fluoride, comprising the steps of:

refining a raw material of calcium fluoride;

causing crystal growth of the refined calcium fluoride;

removing, prior to said crystal growth step and in addition to said refining step, moisture contained in the calcium fluoride.

3. A method according to Claim 2, further comprising adding, prior to said refining step, a scavenger of not less than 0.001 mol% and not greater

than 0.1 mol% to the raw material of calcium fluoride.

4. A method according to Claim 3, wherein the amount of scavenger addition is 0.02 mol%.

5. A method according to Claim 2, further comprising adding, after said refining step, a scavenger of not less than 0.005 mol% and not greater than 0.05 mol% to the refined calcium fluoride.

6. A method according to Claim 2, wherein said moisture removing step comprises heating the raw material of calcium fluoride in a vacuum ambience or a reduced pressure ambience.

7. A method according to Claim 2, wherein said moisture removing step comprises heating a container for accommodating the raw material of calcium fluoride therein, to thereby heat the raw material of calcium fluoride.

8. A method according to Claim 2, wherein said moisture removing step is carried out in a gas-flow ambience in which a gas for promoting removal of moisture is flown.

9. An apparatus for producing calcium

fluoride crystal, comprising:

a first processing unit for refining a raw material of calcium fluoride;

a second processing unit for causing crystal growth of the calcium fluoride; and

a third processing unit, separate from said first and second units, for removing moisture contained in the calcium fluoride.

10. An apparatus according to Claim 9, wherein said third processing unit includes a processing chamber for accommodating the raw material of calcium fluoride therein, an exhaust unit for maintaining a reduced pressure ambience or a vacuum ambience inside said processing chamber, and a heating unit for heating the raw material of calcium fluoride.

11. An apparatus according to Claim 10, wherein said processing chamber has a container housed therein, for accommodating the raw material of calcium fluoride therein, and wherein said heating unit heats the raw material of calcium fluoride together with said container.

12. An optical element manufactured from a calcium fluoride crystal as recited in Claim 1.

13. An optical element manufactured from a calcium fluoride crystal as produced in accordance with a method as recited in any one of Claims 2 - 8.

14. An optical element manufactured from a calcium fluoride crystal as produced by use of an apparatus as recited in any one of Claims 9 - 11.

15. An exposure apparatus, characterized in that ultraviolet light, deep ultraviolet light and/or vacuum ultraviolet light is used as exposure light, and that a workpiece is exposed by irradiating the same with the exposure light through an optical system including an optical element as recited in Claim 14.

16. A device manufacturing method, comprising the steps of:

exposing a workpiece by use of an exposure apparatus as recited in Claim 15; and

performing a predetermined process to the exposed workpiece.

17. A device as manufactured from a workpiece exposed by use of an exposure apparatus as recited in Claim 15.